

anatomy he used specially prepared skeletons and alcohol specimens, which enriched the collections of the museum. He also collected abnormalities and gathered about 100 specimens including birds, e.g. a goose with three hind limbs.

The next strong increase of the ornithological inventory by expedition collections fell in the period of 1933-1941 when D. KASHKAROV, the founder of the Russian scientific school of ecology, headed the department. The outstanding representatives of this school were P. MALCHEVSKY, G. DOPPELMAIR, A. ALEKPEROV, G. NOVIKOV, L. SHULPIN, and A. MALCHEVSKY.

2. PRESENT STATE

Today the ornithological collections contain about 7,000 bird specimens in 1100 species from different regions of the world: New Zealand, Australia, New Guinea, Asia, Africa, Brazil, North America, and Europe. These are mounts and skins (ca 4,500), skeletons (150), alcohol specimens (150), frozen/buffered tissue samples (140), nests (ca 100), eggs sets (ca 800), and also records of bird sounds (5,000). The bird fauna of the former Soviet Union is represented most completely. Practically all of the 768 species are available including rare and Red Data Book species, such as Japanese Crested Ibis, Marbled Duck, Red-breasted Goose, White-fronted Goose, White Crane etc. Many species are represented by geographical series of skins and stuffed birds in different plumages. All recent bird orders of the world are represented.

The bird collections are used in the department of vertebrate zoology to present the following lectures and courses: vertebrate zoology, general ornithology, bird systematic, zoogeography, vertebrate ecology, terrestrial vertebrate fauna of NW Russia, and practical courses of bird identification. The collections are also very significant for the environmental education of schoolchildren, teachers and birdwatchers. Every year the final stage of the „biological olympiad“ for schoolchildren of St. Petersburg is held in the department, and seminars to improve the qualification of schoolteachers are regularly carried out here.

Unfortunately, a catalogue of the ornithological collections has never been published. Catalogues for the internal use were compiled several times, but as consequence of large-scale historical perturbations (revolutions, wars) they were destroyed. A last attempt to compile a hand-written catalogue was undertaken in 1980s. All ornithological specimens were listed. But the fate of this manuscript was also sad: a half of it was consumed by fire in 1995. Now an electronic database is being created, but this work goes on slowly because of lack of staff. Only one technician is employed for the collection. All other work for the museum is carried out by volunteers in the department.

Collaborators in the department gained good experience in cleaning and restoring old skins. During many years the plumage of many specimens became dirty. In 1971-1973 a method of feather cleaning was developed (STARIKOV & SAVINICH 1999). It was very successful and later on was used for restoring stuffed birds damaged by fire. Some of them could not be restored, because part of the plumage was burnt. The feathers retained from labeled skins marked the beginning of the feather collection which is used for the study of feather structure, DNA-analysis etc. Additionally, a special collecting of feathers began according to the method of HARTMANN (1999). Today additions to the museum collections come from dead birds in zoological gardens or birds killed on roads, at electric lines etc.

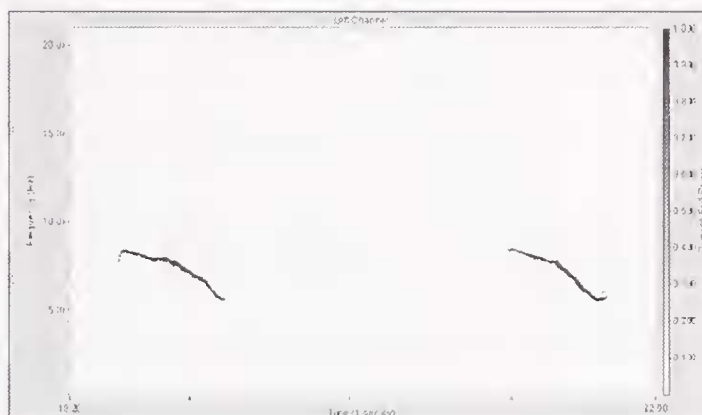


Fig. 1: Sonagram of two calls of a Woodcock chick (*Scolopax rusticola*), recorded by A. MALCHEVSKY on June 1959 in the Leningrad region.

3. THE ANIMAL SOUND LIBRARY OF THE DEPARTMENT OF VERTEBRATE ZOOLOGY

The archive of tape recordings of animal acoustic signals occupies a particular significant status in the collection of the Zoological Museum of the Department of Vertebrate Zoology. More than 40 years ago the first tape recordings of birds were the start of the Animal Sound Library at St. Petersburg University. In May and June 1959 A. MALCHEVSKY (1915-1985) obtained these first recordings (MALCHEVSKY 1963, VEPRINTSEV 1979). Records of Common Crane (*Grus grus*), Black Woodpecker (*Dryocopus martius*), mating signals of Corn Crackle (*Crex crex*), Eurasian Cuckoo (*Cuculus canorus*), songs of the Redwing (*Turdus iliacus*), calls of the Woodcock chick (*Scolopax rusticola*) and some others were among the first. Due to his enthusiasm and energy, Prof. MALCHEVSKY obtained about 100 recordings of 50 bird species up to 1961 (MALCHEVSKY 1963). Many of these recordings not only have a historical significance, but are a basic part of the sound archive.

In 1971, on the basis of the sound recordings collection of Prof. MALCHEVSKY the Animal Sound Library (Phonoteka) was established. From 1971 to 1973 K. BOLSHAKOV was the first curator of this archive. The number of zoologists who are mainly involved with the recording of sounds (especially of birds) significantly increased at the University during that time. A. BARDIN, K. BOLSHAKOV, I. ILJINSKY, G. NOSKOV, YU. PUKINSKY, S. REZVYJ and some other zoologists contributed significantly to the Sound Library. In 1984 the famous zoologist, Dr. I. NEUFELDT, passed a huge part of her own collection of bird recordings which she had obtained in the southern part of the Far East and Amursky region to the Sound Library.

Now the Sound Library consists of more than 5,000 recordings from more than 400 species, including birds but also amphibians, reptiles and mammals. However, recordings of birds are more varied and numerous. Recordings were gathered in the extensive area of Russia, and exceptionally in Crimea, the Caucasian Mountains, and the deserts and highlands of Middle Asia (Turkmenia and Uzbekistan). Some recordings were obtained from Antarctica, Bulgaria and some other places. In the 1990s the collection was completed with some recordings of bird voices from Alaska (E. KRETCHMAR).

The basic aim of the sound recording collection is to serve scientific studies (MALCHEVSKY 1981, 1982). Therefore the archive is documented. Every unit of the collection bears such data as scientific and common name of the recorded animal, its gender and age, date and location of the recording, description of probable functional and situational context, author of the recording, and some additional technical information (weather data, recording equipment etc). The sound archive is also used for educational purposes in biology. Recordings are used not only for some special courses, but also for practical and experimental work in the students' individual graduate programs. Additionally, recordings of the Animal Sound Library were used as acoustic illustrations in educational and popular scientific movies, in sound guides on cassette: „Talking birds and birds of the White Nights“, „Voices of rare mammals and birds“, „Voices of birds in Ussuriland“ and some others (ZYKOVA 1974, SELLAR, BOSWALL & KETTLE 1977, BOSWALL 1979, BOSWALL & DICKSON 1979, BOSWALL 1981, et al.).

At the present time conservation and restoration of tapes is carried out in the Sound Library. Recordings are copied in a digital form (CD-R) by means of processing on personal computers. The Animal Sound Library still has no special staff in the University's budget. The assistant professor of the Department of Vertebrate Zoology, Dr. Ivan ILJINSKY, has been the curator of this collection since 1973. S. MENSHIKOVA,

E. KRETCHMAR and many other teaching zoologists also participate in the collecting activity and contribute to its growth.

The Museum is open for research not only for zoologists and students of St. Petersburg University. Any person from outside working on zoology or bioacoustics is welcome to use the collections of the department.

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History of the Bird Collections at the Zoological Museum of Moscow University and their Role for Russian Ornithology

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Abstract. A history covering the past 210 years of the bird collection of the Zoological Museum of Moscow Lomonosov State University (ZMMU) is presented here. Periods of increase of the collection reflect stages of increasing interest in ornithology in Russia, because science priorities correlate with the need of scientific collections. Many regional and national handbooks are based on specimens deposited in the museum. The value of the collection of ZMMU will be demonstrated by some examples, and comparisons will be made between this collection and others in the former USSR. The results of recent efforts to prepare a catalogue of type specimens are also discussed.

We will give information about (1) the collection: volume, composition, forms of preservation, geographic coverage, completeness of documentation, and availability of rare and extinct species, and (2) the staff of the Ornithological Department.

The possibilities for collecting birds in Russia and the main directions of the ZMMU collection management are also discussed. New types of collection material, creation of computerized catalogues, and cooperation in this field with other museums are among the future priorities.

Key words. bird collection, Moscow, history of the avian collection, ZMMU, Russian ornithology



Fig. 1: The Zoological Museum of the Moscow State Lomonosov University

1. HISTORY OF THE COLLECTION

We welcome you to the Zoological Museum of Moscow State Lomonosov University (ZMMU) and provide here some information about its ornithological collection. The Museum was established in 1791 as a Natural History cabinet, but was soon transformed into a purely zoological museum (ROSSOLIMO 1991). Unfortunately however, most of the original collections including all ornithological material were lost in 1812 during the Napoleon War. A new director of the Museum, Fischer von Waldheim, then began to restore the collections with his own material as well as with help from the Moscow Society of Naturalists which he himself founded in 1805.

In 1822, the museum had 422 bird specimens. Prior to the 1840s the collection mostly comprised mounted specimens, usually without associated documentation. This material can still be found in the current museum exhibition. As they lack any collection data, it is difficult to use these specimens for research.

The next period of the museum's history was linked with activities of its director (from 1863) Anatolii BOGDANOV. His energy stimulated an increase in collecting activity. He established both the activities of the Society Amateurs for Natural History & Anthropology, and the Moscow Zoo. Several thousand specimens were added to the ornithological collection in the second



Fig. 2: Johann Gotthelf FISCHER VON WALDHEIM (or Gregory I. FISHER) 1771-1853



Fig. 3:
Anatoli Bogdanov
1834-1896

half of the 19th century, mainly in the form of skins with labels containing scientific data. The style of collecting and the careful attention to scientific materials were formed in the museum in BOGDANOV's time and became the tradition which is still followed today.

At the end of the 19th century, Mikhail A. MENZBIER published his two-volume (1,200 pages) „Birds of Russia“ (MENZBIER 1893-1895). It was the first all-Russian review of birds, and it was based entirely on the collections of the ZMMU. MENZBIER mentioned that Russian ornithology was far behind that of the rest of Europe and the following historical events, such as the revolution and following decades of isolation in Russia did not help to reduce these differences. But this book stimulated the studies – and collecting in particular – of Russian birds in all parts of this huge country.

As a result of MENZBIER's book and due to activities of ornithologists from St.Petersburg, birds became the best studied animals in Russia at the turn of the cen-



Fig. 4:
Georgy DEMENTIEV
1898-1969

ture. However, the gain for the collections of the ZMMU was still low, at least much lower than that of the Zoological Institute in St. Petersburg. By 1917 the bird collection in the ZMMU numbered 10,955 specimens.

After the October Revolution of 1917, our collection sharply increased in size. Initially this was due to private collections being donated to the ZMMU, but later special expeditions were organized, especially in the 1930s. We also suppose that the move of the country's capital from St.Petersburg to Moscow was another reason for further collection growth; that is because from the official point of view the Zoological Institute in St. Petersburg (ZISP) had decreased in its role as an all-union centre of studies on systematics and of collecting. As a result, this period saw the most intensive increase in growth of our bird collection.

In 1931, the position of a curator of the bird collection was introduced, and Georgy DEMENTIEV (Fig. 4) was appointed to fill this role. In the following years a team of scientific staff was established in the museum. This period saw the start of active collecting by Eugenii SPANGENBERG, Alexey MIKHEEV and others in different parts of the Soviet Union, and to some extent this tradition is still alive today.



Fig. 5:
Sergey Buturlin
1872-1938

In the first half of the 20th century, especially after 1917, the museum bird collection was most effectively used for research. Sergey BUTURLIN (Fig. 5), though an amateur, undertook a comprehensive study of all specimens in the museum collection and identified them to species and subspecies level. He was later joined by Georgy DEMENTIEV. Their five volume „Complete Key to the Birds of the USSR“ (BUTURLIN & DEMENTIEV 1934-1941) was the main result of that work. In it, the birds of the former USSR were described in detail on a subspecific level for the first time. With only a few amendments it is still in use for the Russian bird fauna (STEPANYAN 1990).

During World War II, collecting activity ceased completely. The whole University, including the Museum, was evacuated to Ashkhabad, Turkmenistan, where an inventory of the bird fauna of Turkmenistan was

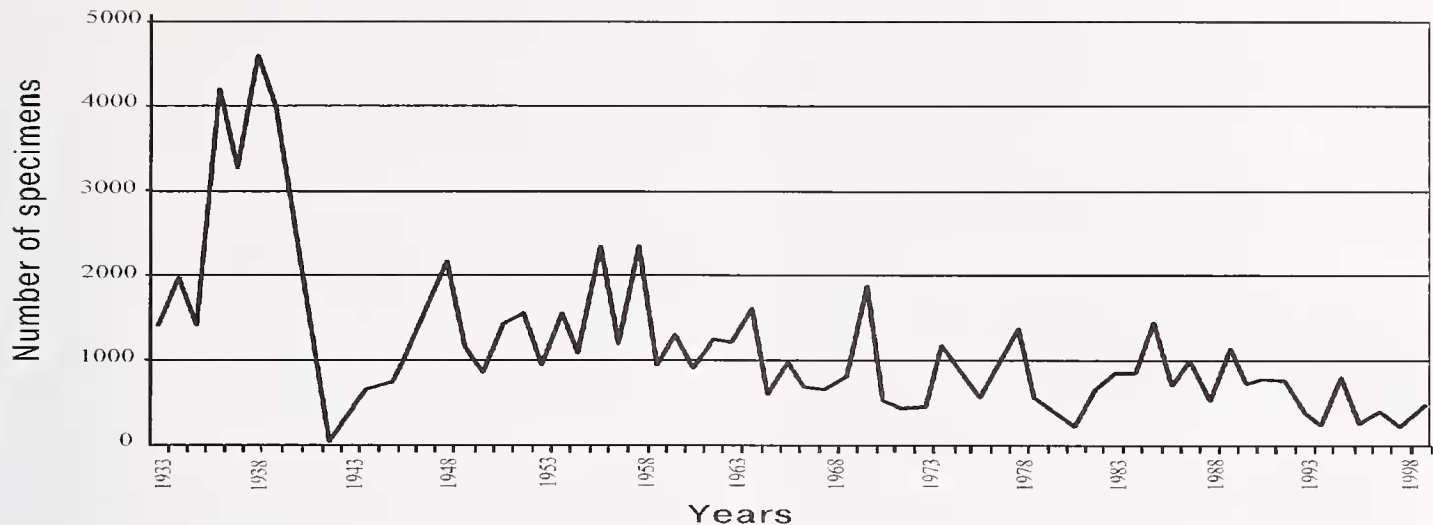


Fig. 6: Annual increase of the bird skin collection in the Zoological Museum of Moscow State University in the years 1933-1999 (from Kalyakin et al. 2001).

started (DEMENTIEV 1952). By the way, this was the only field research DEMENTIEV did in his life, as his main field was the study of literature and museum collections.

After World War II, birds were again actively collected as a result of a programme by the Academy of Science of the USSR to obtain an inventory of nature resources in the country. However, collecting was not as effective as it had been in the 1930s.

The bird collection of the ZMMU was also the main source of information for the compilation of the most complete handbook on Russian birds: the famous „Birds of the Soviet Union“. This key work in six volumes was edited and published by Georgy DEMENTIEV and Nikolay GLADKOV in only three years (1951-1954), and was also translated into English.

In the 1960s, other fields of ornithological research took priority over faunistics, zoogeography and systematics in the USSR. As a result, collecting activity and thus increase of the bird collection of the ZMMU gradually diminished (Fig. 6). Another probable reason for this trend was the establishment and progressive development of regional science centres where collections were also started (such as those in Kiev, Alma-Ata, Vladivostok, Kharkov, and Tashkent).

Currently, the museum primarily receives small collections or single dead birds from various research institutions, amateurs and the public. A certain amount is obtained by museum staff during expeditions. The use of the collections for the preparation of a new handbook on birds of the USSR that was started in the early 1980s, was far from being intensive; it was even less intensive than in the 1930-1940s, as PRIKLONSKI (2001) recently evaluated.

It can be concluded that in Russian museums a clear trend can be seen, which possibly is similar to that in West European countries. This is a sharp decrease in funds for the collection of new materials. The recent state of museum research is characterized by revived interest in historical studies based on the available collections, such as studies of memorial collections, original descriptions, type specimens, taxonomic revisions, and the hope for a possibility to monitor regional faunas.

Even when we see hardly any chance to obtain new collections at the moment, we are looking for possibilities to receive new specimens (KALYAKIN et al. 2001). Collecting is difficult nowadays because of financial problems, difficulties of getting collecting permits in certain regions, „greener“ attitudes in the society, lack of special courses in universities, lack of clear short-term aims for collecting, and also by difficulties in stuffing skins. However, we hope to overcome these difficulties.

2. THE BIRD COLLECTION TODAY

At present the ornithological collection of the ZMMU contains 117,000 bird skins, over 6,000 nests with clutches of eggs, and 2,900 alcohol specimens. We are also proud of our collection of downy chicks, which contains about 3,000 specimens. The 1,760 bird skeletons belong to the Section of Evolutionary Morphology. Recently we also started to collect and keep bird tissues for DNA analysis in buffer or alcohol (2,000 specimens from 350 bird species) and flat spread wings (750 specimens) (Fig. 7). When we compare the current bird collection of the ZMMU with other similar collections in Russia, we see that it is the second in size after ZISP with over 160,000 bird



Fig. 7: Numbers of specimens (bird skins, downy chick skins, bird skeletons, nests with clutches, spread wings, tissue for DNA analysis) in the bird collection of the Zoological Museum of Moscow University (November 2001).

skins. The museum collection of nests and eggs is the largest one in East Europe and North Asia, and undoubtedly the largest in the world for the fauna of North-East Palearctic. The bird exhibition of the museum is not very large, it has 1184 specimens displayed, but the space in the exhibition halls limits our possibilities to show bird diversity.

In the collection of study skins, birds from the former USSR territory predominate. Only a few vagrant and extremely rare species are missing. In the collection of downy chicks, divers, geese & ducks, waders, gulls and auks are all well represented. Other rather large collections are from Mongolia and China (about 1,000 each), and the USA (several hundred).



Fig. 8:
Vladimir LEONOVICH
1924-1998

Among specimens of extinct and threatened species, the following species deserve mention: a Passenger Pigeon (*Ectopistes migratoria*) and a Carolina Parakeet (*Conuropsis carolinensis*) which are in the museum exhibition, skins of Short-tailed Albatross (*Diomedea albatrus*), Slender-billed Curlew (*Numenius tenuirostris*), Common Scaly Woodpecker (*Picus squamatus*), Aquatic Warbler (*Acrocephalus paludicola*), Jankowski's Bunting (*Emberiza jankowskii*).

Series of skins of Hawk Owls (240 specimens), large falcons (600), Goshawks (420), Willow Grouses (720 specimens) and some other species are also of great scientific importance. Series of hybrid buntings, grasshopper warblers, dippers, goldfinches (in total up to 1,000 specimens) are also unique.

The collection of nests together with eggs is a pride of the museum. The oldest labelled eggs are those of House Sparrow, Pied Wagtail and Isabelline Wheatear from the collection of Ivan OSTROUKHOV. They were collected north of the Caspian Sea in 1854 and 1855. The tradition to collect and keep together both eggs and nests started in the 1930s, and is unusual for western museums. The collection of Vladimir FLINT (initially 760 egg sets) was donated to the museum in 1970 and became the real basis for the modern oological collection in the museum. The largest and most valuable additions to the oological collection were private collections of Vladimir LEONOVICH (Fig. 8) and Alexander KUZ'YAKIN (1,200 and 1,000 egg sets, respectively). Approximately 80% of the breeding bird fauna of the former USSR are represented in this oological collection.

Most of the museum collections are kept in cardboard boxes, though large birds are stored in large wooden boxes. Previously all these were placed in wooden cabinets, however by the request of firemen the cabinets were broken down about 25 years ago and replaced by open metal shelves. Absence of tightly closed rooms and cabinets creates a lot of problems: it is necessary to use insecticide for each individual specimen box annually. Nests with eggs are mostly kept in cardboard boxes with glass lids. Alcohol specimens are stored in various glass vessels on shelves. All the collections are placed according to the Checklist of the USSR bird fauna by Leo STEPANYAN (1990).

Researchers are allowed to study specimens in the collection by appointment. Russians also have to complete a special application form. The study of eggs, with few exceptions, is allowed in the presence of a curator. Up to 50 researchers, usually 25-30, visit us annually to work in the collection, with only about five visiting from abroad. Exchange of specimens is rare, especially during the past 15 years when funding difficulties have prevented it. Exchanges have been